



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : B65B	A2	(11) International Publication Number: WO 00/64738 (43) International Publication Date: 2 November 2000 (02.11.00)
(21) International Application Number: PCT/DK00/00204 (22) International Filing Date: 19 April 2000 (19.04.00) (30) Priority Data: PA 1999 00562 23 April 1999 (23.04.99) DK (71) Applicant (for all designated States except US): SCHUR PACKAGING SYSTEMS A/S [DK/DK]; Fuglevangsvej 41, DK-8700 Horsens (DK). (72) Inventor; and (75) Inventor/Applicant (for US only): HANSEN, Erik, J. [DK/DK]; Askevej 8, DK-8700 Horsens (DK). (74) Agent: K. SKØTT-JENSEN PATENTINGENIØRER A/S; Lemmingvej 225, DK-8361 Hasselager (DK).		(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), DM, EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>In English translation (filed in Danish).</i> <i>Without international search report and to be republished</i> <i>upon receipt of that report.</i>
(54) Title: METHOD AND APPARATUS FOR PACKAGING PRINTED ARTICLES SUCH AS NEWSPAPERS IN SHEET WRAPPERS (57) Abstract <p>For individual foil packaging of newspapers which are delivered from a rotary printing press with high capacity, the newspapers are fed hanging down from a gripping conveyor which bring the newspapers to fall down into a V-shaped gap between two foil webs (22, 24), which in brought-together condition in under a retaining pressure belt (10) are thereafter fed for partial circulation around a drum element (8). The foils are fed at such a speed that a certain small interval will arise in between the newspapers arriving successively between the two webs. The drum element (8) is configured with integrated welding jaws (36), the movement of which is synchronised within said interval for carrying out transverse welding of the foil webs in between the items, and outer welding rollers (42) effect a longitudinal welding along the side edges of the webs. The webs are cut through along the transverse welds by means of operable co-rotating knives on the drum element, and in their passage of a reversing roller (14) for the retaining pressure belt (10), the now individually-packaged items are discharged to a conveyor for further transport.</p>		

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece			TR	Turkey
BG	Bulgaria	HU	Hungary	ML	Mali	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MN	Mongolia	UA	Ukraine
BR	Brazil	IL	Israel	MR	Mauritania	UG	Uganda
BY	Belarus	IS	Iceland	MW	Malawi	US	United States of America
CA	Canada	IT	Italy	MX	Mexico	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NE	Niger	VN	Viet Nam
CG	Congo	KE	Kenya	NL	Netherlands	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NO	Norway	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	NZ	New Zealand		
CM	Cameroon		Republic of Korea	PL	Poland		
CN	China	KR	Republic of Korea	PT	Portugal		
CU	Cuba	KZ	Kazakstan	RO	Romania		
CZ	Czech Republic	LC	Saint Lucia	RU	Russian Federation		
DE	Germany	LI	Liechtenstein	SD	Sudan		
DK	Denmark	LK	Sri Lanka	SE	Sweden		
EE	Estonia	LR	Liberia	SG	Singapore		

**Method and apparatus for packaging printed articles
such as newspapers in sheet wrappers.**

The present invention concerns a method and an ap-
5 paratus for the foil packaging of newspapers and similar
printed articles which e.g. are fed from a rotary printing
press with high capacity. It is known to carry out such a
packaging in the formation of stacks of newspapers from which
the newspapers can be fed through a packaging station with
10 considerably smaller capacity, but with the invention it is
aimed at carrying out the operation on an in-line basis, e.g.
with a capacity of 25-30,000 items per hour, i.e. up to 10
items per second.

Relevant machines which can operate with more or
15 less high capacity have already been proposed, cf. e.g. DE 38
38 985, US 4,683,708 and JP-A-110 70913, but still with ar-
rangements for the group-handling of newspapers to make it
possible for these to be handled in an intermittent manner,
with a necessary consumption of time in association herewith.
20 The machines hereby become relatively complicated and expen-
sive.

It is an object of the present invention to provide
a method of packaging whereby a regular flow-packaging of the
printed articles can be achieved in a relatively simple man-
25 ner, i.e. where these are fed in a fully continuous manner
through a packaging arrangement inserted in the item flow.

According to the invention, this can be achieved by
the execution of the method as disclosed and characterised in
claim 1. Despite a high feeding rate, the printed articles
30 will hereby be subject to a certain "period of rest" against
a relatively firm supporting surface in the plant, i.e. the
surface of the drum, which in a simple co-rotating manner can
present the necessary tools respectively for a transverse
welding together of the opposing webs of packaging foil bet-

ween the successively-fed printed articles, and a cutting through of the relevant connection areas. It is herewith taken into consideration that the period of time available for which the items are retained on the surface of the drum will
5 be rather brief with the passage of an item on the drum with minimised diameter due to the relatively high rate of feed, so that there will hardly be time for carrying out an otherwise conventional thermal cutting-through of the packaging in connection with the weld closing of the respective ends of
10 the items. These packaged items can thus still be delivered as fully separated items when working with an active cutting through, preferably by use of co-rotating knives on the drum.

An associated side-closing of the foil packages will be easier to achieve, since such a closing can be established by a roller welding at any place in the feeding path,
15 though preferably in connection with the passage of the items on the drum.

In the following, the invention is explained in more detail with reference to the drawing, in which

20 fig. 1 is a schematic side view of a machine according to the invention,

fig. 2 is a sectional view of a feeding drum used herein, and

25 fig. 3 is a perspective view of a set of tools housed in the drum .

In fig. 1 it is shown that folded newspapers 2 are fed hanging down in a gripping conveyor 4, possibly directly from a rotary printing press. At the point A they are released to fall freely down to an underlying packaging machine 6.
30

As its main components, this machine has a drum element 8 with a pressure belt 10 which runs over rollers in the form of a feed-in roller 12, a feed-out roller 14 and a pair of outer return rollers 16, and bearings 18 for supply

rollers 20 for two packaging foil webs 22 and 24, which via uppermost, mutually separated rollers 26 directly under the point A are guided downwards in V-formation to run on the feed-in roller 12 under pressure from a counter-pressure roller 28, after which the webs which are now brought together are fed around the drum 8 in under the pressure belt 10 or band corresponding hereto. After a lower pressure roller 30, the webs are conveyed as a packaged product 32 out over conveyor 34 leading away from the plant.

The drum 8 is configured with a number of longitudinal welding jaws 36 with a distance along the periphery of the drum corresponding to slightly more than the hanging extent of the newspapers 2. A counter-pressure roller 40 or several of such rollers can if necessary create increased welding pressure in against the drum. For the welding in the feeding direction of the webs 22,24, one or more welding wheels 42 are arranged at both sides outside the pressure belt 10.

During operation, the newspapers will successively fall down in the upper V-space between the foil webs 22 and 24, in that the rate of feed is adjusted in such a manner that there will arise a free interval between the descending newspapers, e.g. in the order of 5 cm. The newspapers are clamped in between the foil webs and via the roller 12 pass down to run around the drum 8. This is carefully synchronised in order to achieve that the said interval between the newspapers will come to lie directly opposite the welding jaws 36, which can therefore possibly project slightly out from the drum, possibly in a movable manner. In connection with the passage of one or more outer pressure rollers 40, or possibly inwardly-pressing spring systems, this will make it possible for the two foil webs to be held together and herewith welded together in the said interval. In a corresponding manner it will be possible to arrange a cutting-through

of the webs along the weld, e.g. by means of knife element projected out from the drum and possibly moved longitudinally. In connection with a welding together of a double foil web, it is well-known that a cutting-through can be effected by thermal melting, but because of the high working speed and the arising operating conditions, with the known apparatus it cannot be assumed as a matter of course that such a weld distribution can be achieved in a reliable manner. Correspondingly, with the invention it applies that there is no basic condition that an absolutely tight welding-in of the newspapers shall be achieved, i.e. interruptions in the welding lines will be acceptable, providing merely however that the packaging holster is suitably closed along the edges in order to cover and surround the contents.

The welding wheels 42 will serve to provide side-edge closures of the passing holsters, and these wheels will have better conditions for creating regular welding-together lines, in that they work outside that area where the thickness of the assembled web varies appreciably during the passing of the newspapers and respectively the said interval between them.

The result will be that the end products designated 32 will consist of individually holster-packaged newspapers, which are delivered to the conveyor 34 in the same number per period of time as that at which the newspapers arrive on the gripping conveyor 4. It can hereby be natural that the products are laid out on the conveyor in a scale-like manner, and the conveyor can thus work with a lower transport speed. Suitable controlling and damping means can be placed at the discharge from discharge roller 30.

When the apparatus as indicated includes reserve supply rollers for the foil webs, it will be a simple operation to carry out a change of rollers when the operative roller is about to become empty, in that a welding of the new

foil web to the preceding web can thus be effected. To the extent that this takes time with a stopping of the apparatus, the dropping of the newspapers at A can be suspended until the apparatus is operative again, and the hereby surplus
5 newspapers can be collected together for delivery in the non-packaged state .

In figs. 2 and 3 it is shown that the welding jaws 36 can be disposed on mutually separate support rails 44 which are locally connected by means of yoke pieces 46 extending inwardly in the drum 8. If desired, the jaws can thus be
10 movable radially in relation to the drum, e.g. by connection to a control cylinder 48. In between the jaws 36, 44 there is housed a knife beam 50 with a protruding, serrated knife blade 52 which, e.g. by means of control cylinders 54, will
15 be displaceable outwards for the cutting-over of the foil 22, 24 centrally between the welds which are effected by the welding jaws 36. This displacement with subsequent retraction should be effected just before the arrival at the discharge roller 30, i.e. by a quite fast operation, and therefore it
20 can be preferred to replace the cylinders 54 with e.g. cam-controlled push-rods. It can also be a possibility to use a knife which can be moved axially.

C L A I M S

1. Method for the foil packaging of newspapers and
5 similar printed items which are fed with great capacity e.g.
from a rotary printing press, c h a r a c t e r i s e d in
that the items are fed in the hanging down position by means
of a gripping conveyor which brings the items to fall down in
10 a V-shaped gap between two opposite, moving foil webs which
are broader than the items, and which are fed further in
clamped-together condition with the printed items lying seri-
ally between the webs and with a short interval between them,
in that the webs are fed partly around a rotating drum ele-
ment in under a retaining pressure belt along a welding sec-
15 tion, where while being pressed against the belt from the
outside they are subjected to a welding-together in the
transverse areas between the items and in the longitudinal
edge areas outside the items, after which the items thus
packaged are separated at the said transverse areas, prefera-
20 bly by means of co-rotating, operable knife elements on the
drum element and during continued clamping between the drum
element and said retaining pressure belt, in that in their
passage of a reversing roller for the retaining pressure belt
the items are released for delivery to conveyor means for
25 further transport.

2. Method according to claim 1, c h a r a c t e r i
s e d in that the said transverse welds are carried out by
means of co-rotating welding jaws on the drum element.

3. Apparatus for the execution of the method ac-
30 cording to claim 1, c h a r a c t -
e r i s e d in that its main component part consists of a
drum element (8) configured with co-rotating, axially-
extending welding jaws, preferably in combined configuration
with operable knife elements, and that it further comprises

feeding rollers for a retaining pressure belt (10) which presses in against the surface of the drum along an appreciable segment of same, and feeding means for the delivery of two opposite foil webs (22,24) via a V-shaped item-delivery sequence for circulation around said drum element along said segment, and means for longitudinal welding together of said foil webs along their outer edges.

4. Apparatus according to claim 3, c h a r a c t e r i s e d in that said knife elements consist of knife beams which can be displaced radially and which are provided with protruding, serrated knife blades.

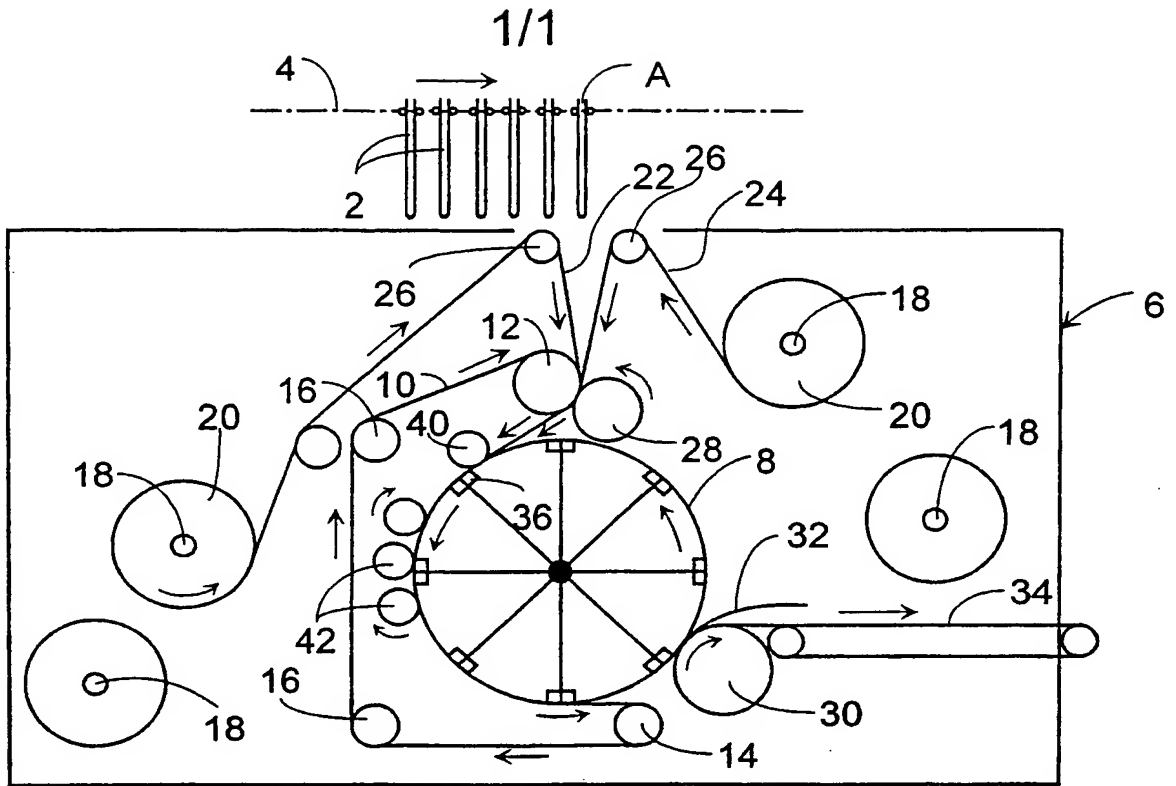


Fig.1

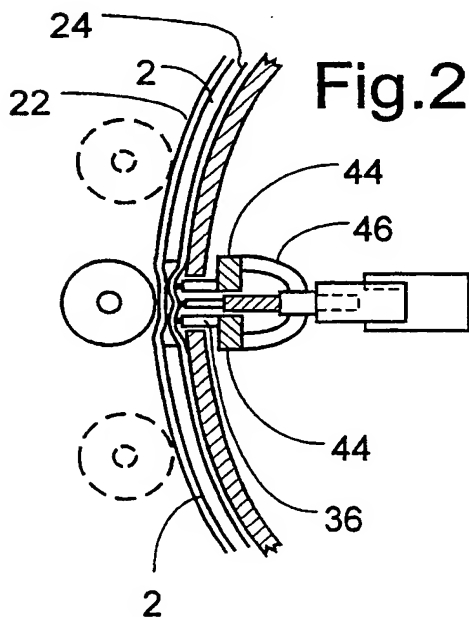


Fig.2

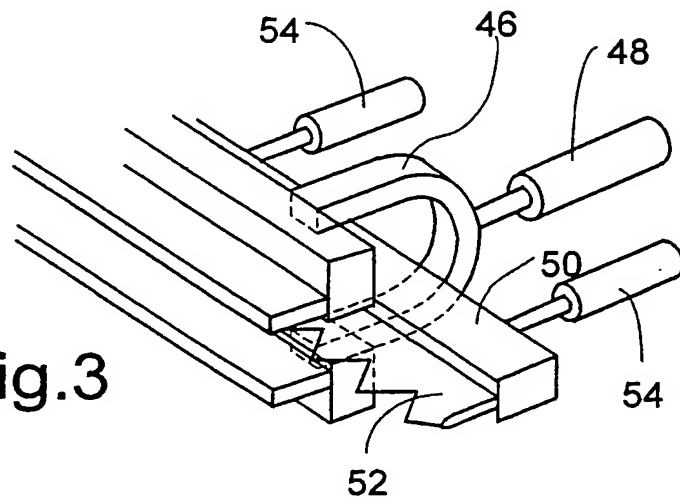


Fig.3

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
2 November 2000 (02.11.2000)

PCT

(10) International Publication Number
WO 00/64738 A3

(51) International Patent Classification⁷: B65B 9/08, 25/14

(21) International Application Number: PCT/DK00/00204

(22) International Filing Date: 19 April 2000 (19.04.2000)

(25) Filing Language: Danish

(26) Publication Language: English

(30) Priority Data:
PA 1999 00562 23 April 1999 (23.04.1999) DK

(71) Applicant (for all designated States except US): SCHUR
PACKAGING SYSTEMS A/S [DK/DK]; Fuglevangsvej
41, DK-8700 Horsens (DK).

(72) Inventor; and

(75) Inventor/Applicant (for US only): HANSEN, Erik, J.
[DK/DK]; Askevej 8, DK-8700 Horsens (DK).

(74) Agent: K. SKØTT-JENSEN PATENTINGENIØRER
A/S; Lemmingvej 225, DK-8361 Hasselager (DK).

(81) Designated States (national): AE, AL, AM, AT, AT (utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, CZ (utility model), DE, DE (utility model), DK, DK (utility model), DM, EE, EE (utility model), ES, FI, FI (utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

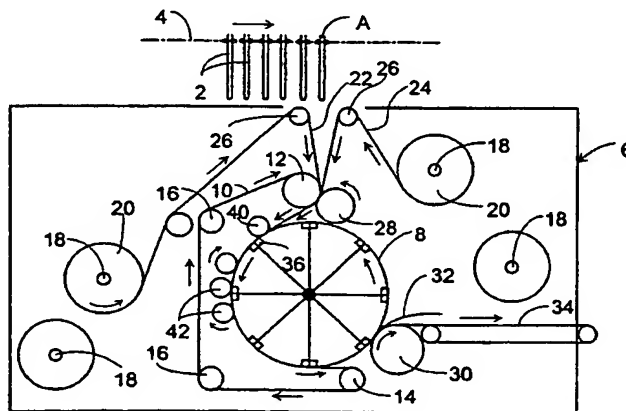
Published:

— With international search report.

(88) Date of publication of the international search report:
25 January 2001

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND APPARATUS FOR PACKAGING PRINTED ARTICLES SUCH AS NEWSPAPERS IN SHEET WRAPPERS



(57) Abstract: For individual foil packaging of newspapers which are delivered from a rotary printing press with high capacity, the newspapers are fed hanging down from a gripping conveyor which bring the newspapers to fall down into a V-shaped gap between two foil webs (22, 24), which in brought-together condition in under a retaining pressure belt (10) are thereafter fed for partial circulation around a drum element (8). The foils are fed at such a speed that a certain small interval will arise in between the newspapers arriving successively between the two webs. The drum element (8) is configured with integrated welding jaws (36), the movement of which is synchronised within said interval for carrying out transverse welding of the foil webs in between the items, and outer welding rollers (42) effect a longitudinal welding along the side edges of the webs. The webs are cut through along the transverse welds by means of operable co-rotating knives on the drum element, and in their passage of a reversing roller (14) for the retaining pressure belt (10), the now individually-packaged items are discharged to a conveyor for further transport.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP00/00204

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B65B9/08 B65B25/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, WPI Data, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 331 242 A (SITMA) 6 September 1989 (1989-09-06) column 1, line 1 -column 2, line 37 abstract	1-4
A	--- US 4 683 708 A (LINDER HEINZ) 4 August 1987 (1987-08-04) column 1, line 49 -column 2, line 29 abstract	1-4
A	--- US 5 335 484 A (HAIN DAVID A) 9 August 1994 (1994-08-09) column 1, line 60 -column 2, line 47 abstract	1-4
	--- -/-	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

5 September 2000

Date of mailing of the international search report

27. 10. 00

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

M. Arvidsson/GH

INTERNATIONAL SEARCH REPORT

International Application No

T/DK 00/00204

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>DATABASE WPI Section PQ, Week 199921 Derwent Publications Ltd., London, GB; Class Q31, AN 1999-248153 XP002901210 & JP 11 070913 A (DOWA SEISAKUSHO KK), 16 March 1999 (1999-03-16) abstract -----</p>	1-4

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP90/00204

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0331242 A	06-09-1989	IT 1216487 B AT 83452 T CA 1301044 A DE 68903848 D DE 68903848 T ES 2036788 T GR 3006791 T US 4964263 A	08-03-1990 15-01-1993 19-05-1992 28-01-1993 19-05-1993 01-06-1993 30-06-1993 23-10-1990
US 4683708 A	04-08-1987	CH 667854 A DE 3603286 A GB 2174058 A,B JP 2076373 C JP 7108700 B JP 61217319 A	15-11-1988 18-09-1986 29-10-1986 25-07-1996 22-11-1995 26-09-1986
US 5335484 A	09-08-1994	DE 69203539 D DE 69203539 T EP 0517404 A JP 5262312 A	24-08-1995 04-04-1996 09-12-1992 12-10-1993
JP 11070913 A	16-03-1999	NONE	